Materials Engineering Branch

TIP*

No. 101 Use of a Primer to Improve Silicone Adhesion

Author(s): Frederick C. Gross Contact: (301) 286-6882

Silicone polymers have been valuable compounds for a variety of uses in the space program since its inception. The interest in silicone polymers has recently been intensified as a result of the discovery in the early Shuttle flights that atomic oxygen, which is present in the Shuttle flight altitudes, appears to have less affect on silicones than it does on numerous other materials (see TIP 099). Obviously, this makes the silicones prime candidates for a host of applications where the adverse effects of atomic oxygen are a major concern.

There are some precautions that must be observed when applying silicone polymers during the fabrication phase. In most applications of this material, for example, when it is used as a paint, adhesive, potting compound, conformal coating or sealant, it is expected to adhere to a wide variety of surfaces. The inherent nature of silicones causes them to have poor adhesion to many surfaces. Therefore, **positive** steps must be taken to compensate for this lack of adhesion.

To maximize the adhesion of silicone compounds, some changes must be made to the substrate surface(s). In many cases, the first steps toward accomplishing this goal involve surface abrasion or etching followed by cleaning. The final step in the preparation of the substrate surface for bonding silicones usually is the application of a primer. As there are several types of primers available, it is important to follow the silicone manufacturer's recommendation for the use of the correct one in each situation and to verify results by test. The composition of the substrate to which the silicone is to be applied will greatly influence the choice of the primer.

Primers ordinarily contain compounds in an activated (reactive) state that require a time-controlled application for satisfactory results. When properly chosen and correctly utilized, a primer can make the difference between success and failure in the application of a silicone polymer.

First Issued: June 1987
Date Revised: October 2002